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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/751,449	01/06/2004	Russell D. Braunling	H0006146-1633	2586

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EXAMINER	
WALLENHORST, MAUREEN	
ART UNIT	PAPER NUMBER
1743	

DATE MAILED: 02/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/751,449	BRAUNLING ET AL.	
	Examiner	Art Unit	
	Maureen M. Wallenhorst	1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-17 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-17 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 4/22/04 & 4/23/04.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. Claims 12-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

On line 3 of claim 12, the phrase "the delay of maintenance" lacks antecedent basis. See this same problem in claim 13.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-2 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Runner (US Patent no. 5,243,298).

Runner teaches of a corrosion monitor and a method for monitoring corrosion of a structure such as an aircraft wing. The monitor comprises an anodic metal material that corrodes preferentially with respect to the structure being tested. Runner teaches that the anodic metal is preferably zinc, but can be other metallic materials that preferentially corrode to the structure

being monitored. The anodic material comprises a wire 10 that is disposed in an environment in which the structure being monitored is located. Specifically, the wire 10 is disposed inside an aircraft wing 12 having a sealed core 14 that is susceptible to corrosion by moisture. Anode wire 10 is preferably disposed between the core 14 and the skin 16 of an aircraft wing 12. A measuring device 22 for measuring electrical resistance is connected across the anode wire 10. Measuring device continuously measures the resistance of the anode wire 10 and continuously calculates the rate at which the resistance changes. If moisture intrusion occurs, anode wire 10 will begin to corrode before core 14, which will remain undamaged until all the anode material has been consumed in the electrochemical corrosion process. Core 14 will not begin to corrode until anode wire 10 has completely corroded through, i.e. after its resistance has become infinite. Measuring device 22 calculates the rate of change of resistance, and also extrapolates the resistance using the present rate of change to the point in time where the resistance is infinite. Thus, measuring device 22 provides an indication of the time remaining before onset of corrosion in the wing core 14. Measuring device 22 has a computer for processing resistance values sampled at suitable intervals. The measuring device may also provide maintenance personnel with the date on which structural corrosion is predicted to occur so as to aid in decisions concerning the continued use of the aircraft or its return for maintenance. Runner teaches that the corrosion monitor provides a valuable maintenance scheduling tool by reducing guesswork since before the onset of corrosion of the wing core 14, the aircraft may be scheduled for maintenance. The maintenance may be scheduled to coincide with the onset of corrosion or to be performed at a later time, after a predetermined amount of structural corrosion has

occurred. See lines 64-68 in column 2, lines 1-68 in column 3, lines 1-2 and 38-68 in column 4 and lines 1-48 in column 5 of Runner.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 3-6 and 9-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Runner in view of Byrne et al. For a teaching of Runner, see previous paragraphs in this Office action. Runner fails to teach that the measuring device 22 measures the corrosion of the metallic anode wire 10 daily, fails to teach that the anode wire 10 has a test portion and a reference portion and that the computer validates the amount of corrosion of the anode monitor based on conditions of the environment.

Byrne et al teach of a corrosion monitor system that facilitates the detection and monitoring of material corrosion in remote areas. The system comprises a sensor that operates on the principal that corrosion of a metallic conductor will cause a corresponding increase in the

cross-sectional electrical resistance of that conductor. This increase in resistance is due to actual material loss during the corrosion of the metallic surface. The sensor comprises a coupon 100 made of a metallic material that is the same as that of a structure being monitored with the sensor. Coupon 100 is divided into two halves 102 and 104 that are separated by a channel 106. Half 104 is covered by a coating 108 and serves as a reference portion or conductor, whereas half 102 is exposed to the environment to serve as a test portion or conductor. Leads 112 and 114 are connected to the halves 102, 104 so as to supply voltage thereto. The system monitors relative changes in the electrical resistance of the test conductor by comparing the voltage across it to that of the reference conductor. This comparison method enables the system to detect very small incremental changes in the resistance of the test conductor. Byrne et al also teach that the corrosion monitor contains a thermistor therein to measure the sensor temperature and compensate the corrosion measurements for the effects of ambient temperature. Byrne et al teach that the corrosion sensor records changes in resistance on a periodic basis over an extended period of time such as once a day. See lines 54-68 in column 1, lines 1-32 in column 2, lines 15-65 in column 3 and lines 12-32 in column 4 of Byrne et al.

Based upon the combination of Runner and Byrne et al, it would have been obvious to one of ordinary skill in the art at the time of the instant invention to measure the corrosion of the metallic anode wire 10 taught by Runner daily since Byrne et al teach that in order to properly monitor the corrosion of a piece of equipment such as parts of an aircraft effectively, measurements of resistance changes in a metallic sensor should be performed once a day in order to detect the sensor material being consumed continuously over time. It also would have been obvious to one of ordinary skill in the art to compare the amount of corrosion detected with the

measuring device 22 taught by Runner with an expected amount of corrosion so as to determine if the aircraft is subjected to more or less of a corrosive environment than expected, and to perform costly maintenance on the aircraft only on an as-needed basis. It also would have been obvious to one of ordinary skill in the art to provide the anode wire 10 taught by Runner with a test portion and a reference portion, similar to the metallic corrosion monitor taught by Byrne et al, since Byrne et al disclose that the measurement of resistance changes in both a reference and a test conductor of a corrosion monitor allows very small incremental changes in the resistance of the test conductor to be detected. It also would have been obvious to one of ordinary skill in the art to validate the amount of corrosion detected by the anode monitor taught by Runner based upon conditions of the environment such as temperature since Byrne et al teach that temperature effects the raw corrosion activity data measured and must be compensated for.

8. Claims 7 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Runner in view of Byrne et al as applied to claims 3-6 and 9-15 above, and further in view of Malver et al. For a teaching of Runner and Byrne et al, see previous paragraphs in this Office action. The combination of Runner and Byrne et al fails to teach that the computer in the corrosion monitor taught by Runner validates the amount of corrosion of the anode monitor based on conditions of the environment such as humidity.

Malver et al teach of a corrosive environment monitor that measures environmental factors such as pH, humidity and temperature since these factors are associated with the corrosion of materials in the environment. See lines 9-24 in column 2 of Malver et al.

Therefore, it would have been obvious to one of ordinary skill in the art to validate the amount of corrosion detected by the anode monitor taught by Runner based upon conditions of

the environment such as temperature and humidity since both Byrne et al and Malver et al teach that temperature effects raw corrosion activity data measured, and Malver et al additionally teach that the humidity of an environment effects the corrosion of materials in the environment, and therefore, both of these factors must be compensated for by being detected and used to adjust the measurements made by the corrosion monitor.

9. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Runner in view of Jansen et al. For a teaching of Runner, see previous paragraphs in this Office action. Runner fails to teach that the metallic anode wire 10 can be made from carbon steel.

Jansen et al teach that carbon steel is particularly sensitive to a corrosive environment. See lines 18-20 in column 1 of Jansen et al.

Therefore, it would have been obvious to one of ordinary skill in the art to fabricate the anode wire 10 taught by Runner out of carbon steel since Runner teaches that the anode wire 10 can be made of any metallic material that preferentially corrodes to the structure being monitored, and Jansen et al teach that carbon steel is very sensitive to a corrosive environment, and therefore, would be expected to corrode preferentially to any metallic structure being monitored.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Please make note of: Davis et al, Martinchek et al, Eden et al, Braunling et al, Rhoades et al, Perkins et al, Foreman et al and CA 2,222970 who all teach of corrosion monitoring methods.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maureen M. Wallenhorst whose telephone number is 571-272-1266. The examiner can normally be reached on Monday-Wednesday from 6:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden, can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Maureen M. Wallenhorst
Primary Examiner
Art Unit 1743

mmw

February 2, 2005

Maureen M. Wallenhorst
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PRIMARY EXAMINER
GROUP [redacted] 1700